DELAWARE CENTER FOR THE INLAND BAYS

Inland Bays Journal

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The Inland Bays Journal is a publication of the Delaware Center for the Inland Bays. The CIB is a nonprofit organization and a National Estuary Program. The purpose of the Inland Bays Journal is to educate and inform citizens and visitors to the Inland Bays watershed about this "estuary of national significance."

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From RESTAURANT to REEF

By Andrew McGowan, Environmental Scientist

For many people, oysters are an iconic coastal delicacy. The mention of oysters may quickly conjure up images of them served raw on the half shell, broiled, grilled, baked, steamed, or fried. In Delaware oysters mean big business for restaurants, especially in the Inland Bays region. However, these bivalves are more than just a delicious treat, oysters play a critical role in the health of our estuaries. As filter feeders that can individually filter up to 50 gallons of water each day, oysters help control phytoplankton populations and improve water clarity. They also capture nitrogen, reducing the effects of nutrient pollution—a major problem for the Inland Bays. Oyster reefs provide structure that is excellent habitat for fish like summer flounder and black sea bass, and also for shellfish like blue crabs. Well-placed oyster reefs also help absorb wave energy during storms, protecting shorelines and communities from damage.

Unfortunately, wild oyster populations are extremely low in the Inland Bays. Diseases decimated oyster populations along the Atlantic coast during the previous century. Delaware's oysters were hit hard, first in the 50's and 60's, and again in the 90's, and local populations haven't recovered. Given the ecological importance of oysters to the Inland Bays, the Center developed an initiative to increase native oyster populations. Recycled oyster shells, volunteer efforts and a new strain of disease-resistant oyster larvae, developed by Rutgers University, all play a key role in the Center's plan.

Oyster restoration typically occurs through the creation of artificial reefs. However, before creating large-scale reefs in the Inland Bays, the Center recognized the need to gather more information about factors that may influence oyster survival. Center staff decided

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A DNREC barge fully loaded with cinder block and oyster shell

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FROM THE DIRECTOR

The Venerable Oyster

The eastern oyster gets respect. An oyster puts in long hours filtering the Bay. It works well with others by constructing reefs that fish love. And it is loyal to its home. So much so that it even tastes like the salty waters from which it is harvested. What other organism can you say that about?

The oyster definitely earns its respect, and we love to give it.

The Center is bringing the oyster back to the Inland Bays after it nearly disappeared due to disease and habitat loss. Thanks to the work of scientists, environmental managers, and volunteers, disease-resistant oysters are now growing on restored habitats and oyster farms around the Bays.

For all oysters do for us, we work for them.

Recently, a culmination of our efforts around oysters came to fruition with the creation of three oyster reefs in the Inland Bays. These pilot projects are designed to test the success of oyster reef creation techniques at different locations. They are a culmination of efforts because volunteers participating in our Oyster Gardening Program provided the live oysters for the reefs, restaurants participating in our Don't Chuck Your Shucks Program recycled the shells that made the reef structure, and our scientists provided the research to select the locations most conducive to reef survival. It all came together over a few days this summer when our talented volunteers and staff installed two reefs in Rehoboth Bay and one in Little Assawoman Bay.

Initial monitoring results show that baby oysters are already growing on the reefs. This is a great sign and inspires me to think about what we can continue to build together for the Bays. I hope you enjoy reading about the reef project and more in this edition of the Inland Bays Journal!

Sincerely,

Chris Bason
Executive Director

(CIB): DE Inland Bays

(James Farm): James Farm Ecological Preserve

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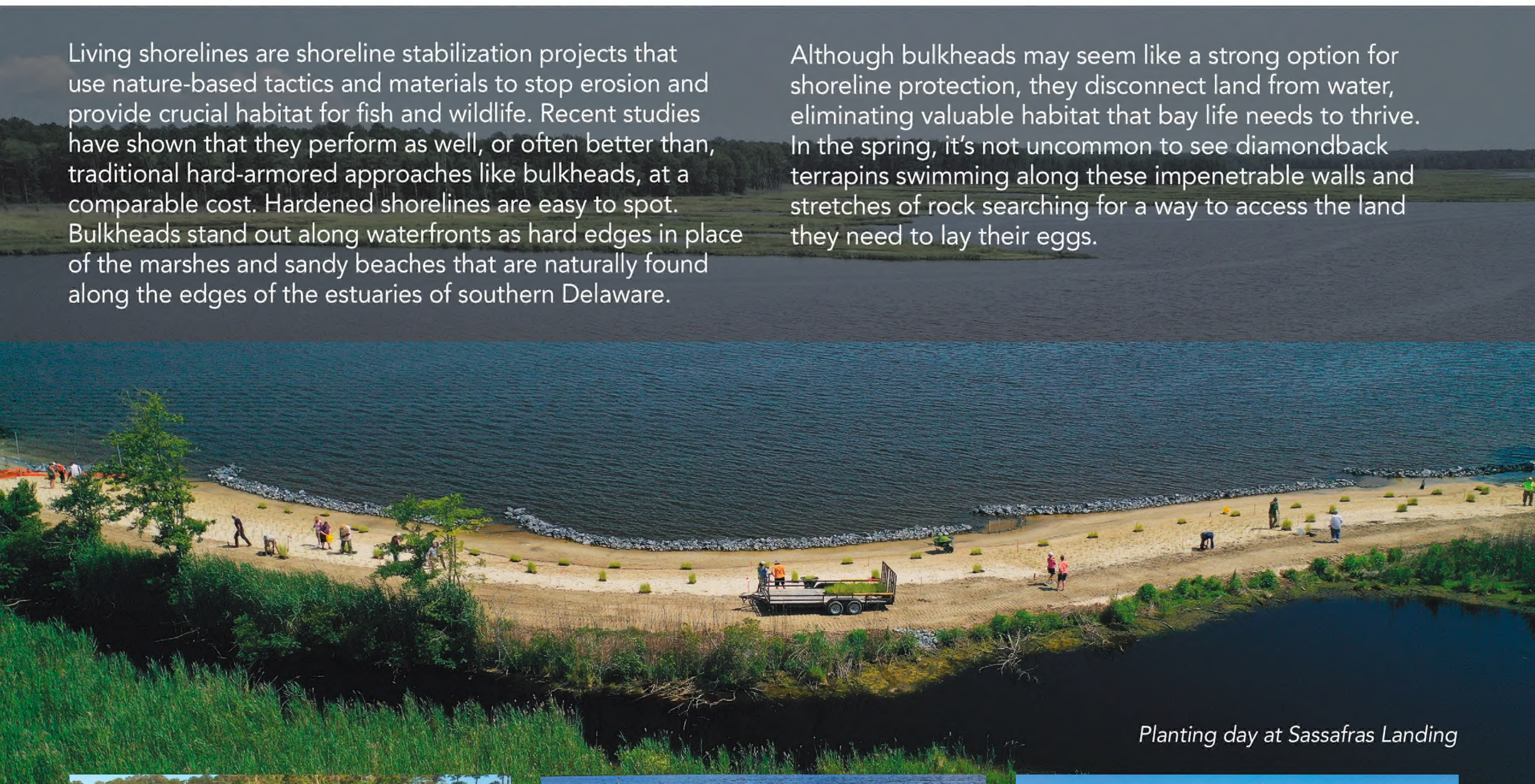
A Standout Shoreline Solution that Blends In

By Marianne Walch, Science & Restoration Coordinator

Living shorelines are shoreline stabilization projects that use nature-based tactics and materials to stop erosion and provide crucial habitat for fish and wildlife. Recent studies have shown that they perform as well, or often better than, traditional hard-armored approaches like bulkheads, at a comparable cost. Hardened shorelines are easy to spot. Bulkheads stand out along waterfronts as hard edges in place of the marshes and sandy beaches that are naturally found along the edges of the estuaries of southern Delaware.

Although bulkheads may seem like a strong option for shoreline protection, they disconnect land from water, eliminating valuable habitat that bay life needs to thrive. In the spring, it's not uncommon to see diamondback terrapins swimming along these impenetrable walls and stretches of rock searching for a way to access the land they need to lay their eggs.



Planting day at Sassafras Landing

Prior to installing the living shoreline, this area was suffering from extreme erosion

Oyster shells from Don't Chuck Your Shucks Restaurants were used in the living shoreline project

The installation of the rock sill. The area behind these rocks was filled with sand and planted with native grasses

This past summer, the Center worked with DNREC and Cardno, Inc. to install a new living shoreline at Sassafras Landing in the Assawoman Wildlife Management Area. Design and construction were supported by a Community Water Quality Improvement Grant awarded to the Center. This project could easily be overlooked by a visitor, but its nature-based design provides a wide variety of benefits for humans and the natural ecosystem.

The project at Sassafras Landing is one of the Center's living shoreline demonstration sites. These projects showcase innovative construction techniques, enhance wetlands, and provide opportunities to educate the public and marine contractors on the benefits of installing a living shoreline.

The design of the Sassafras Landing project includes a low offshore sill, made of rock and recycled oyster shell, behind which nearly 13,000 square feet of new salt marsh was created. The restored marsh will act as a buffer to prevent erosion from boat wakes and storms. It also provides long-term protection for 35 Acre Pond, a freshwater habitat managed for migratory waterfowl. The thin berm that separates this freshwater impoundment from the brackish water of Miller Creek, a tributary of Little Assawoman Bay, had severely eroded and was in danger of failing. Within days after construction, diamondback terrapins were seen nesting on the restored shoreline, and schools of minnows in the new tide pools had attracted herons and egrets. Volunteers with the Center's Shorezone Fish and Blue Crab Survey are monitoring the site to gather data on how fish are using this living shoreline.

In the Center's work to preserve, protect and restore Delaware's Inland Bays, living shorelines play a key role. For homeowners or property managers concerned about waterfront erosion, a living shoreline may be a natural solution that would benefit the bays!

For more information about living shorelines, you can visit delawarelivingshorelines.org.

Early Experiences in Nature Inspire Future Stewardship

Intro by Amy Barra, essay by Robert Blye

If you visited the James Farm Ecological Preserve this past fall, you may have seen groups of students dashing through the field with nets, quietly sketching in journals, or discussing storm-proof building techniques on the beach. Not only were these 4th graders developing important foundations for scientific learning, but for many of them, they were experiencing the natural habitats of the Inland Bays for the first time.

Childhood experiences in nature have increasingly been linked to an understanding of and appreciation for natural systems. Many of the Center's staff and volunteers can fondly recall childhood memories of time spent in nature and most credit these experiences as the "spark" that began their interest in environmental work. In an effort to share more of these stories, the Center conducted a family and nature essay contest during the summer of 2019. The first place winner, Robert Blye, told how his experiences inspired his career path and have helped him influence future generations. As part of his prize package, Robert and a few friends and family members were treated to an evening on the Center's pontoon boat, and his essay is included in this edition of the journal.

So whether you have an opportunity to take students for a trip to the James Farm, or you have the perfect "guppy catching" puddle, be sure to take time to make some memories outdoors!

Sara Jo and Isaac Cohen identifying fish with the Center's Fish Survey volunteers

Catching Guppies

By Robert W. Blye

Born in Philadelphia, I moved as a toddler to rural Exton, Pennsylvania after my father's Army service. My earliest memories include playing with friends in a stream "catching guppies." In those days, our mothers (Dads were at work) dressed us for the day, ushered us outside and said be home for lunch (or dinner). We walked across the road to a stream where minnows, turtles, frogs, and crayfish abounded. We captured hapless specimens that we then released. What a wonderful experience.

At six, my Great Aunt Marion, who needed a birding companion, invited me on some adventures. I was the oldest in my cohort and had an interest in nature, so I fit the bill. We explored her small farm in Paoli and birded Tinicum, Brigantine, Hawk Mountain, Cape May and Bombay Hook. I had binoculars and a Peterson Field Guide; we kept lists but none survived to adulthood. One of her sons earned a Ph.D. in ornithology from Cornell which piqued my interest. Why work inside if one could study or manage wildlife? I applied to the NYS College of Agriculture at Cornell as wildlife major and graduated in 1972.

I was hired to work as a terrestrial ecologist by Ed Raney, Professor of Ichthyology at Cornell. Dr. Raney started one of the first ecological consulting companies, to help industry comply with the 1970s environmental laws. I spent the first four years cataloging the terrestrial plants and animals of a huge, undeveloped power plant site on the Schuylkill River in

The Center's Fish Survey volunteers at Rehoboth Beach Country Club

Left to Right: Shank McCorkle, Lynn Lambertson, Paula Schneider, Bob Blye, Jane Getchell, Isaac Cohen, Sara Cohen, Camilla Los, Joe Fanelli, Madeline Brennan, Beth White, Marty Yerrick, and Teresa Flury

southeastern Pennsylvania. I assisted the fisheries biologists and entomologists with their studies which provided a good background in aquatic ecology. I was such a good biologist they made me a project manager, and my career slid downhill until I became company president.

My three daughters spent time with their cousins "catching guppies" at my parent's rural retreat in far northeastern Pennsylvania: bass, sunfish, and salamanders in the pond; crayfish, minnows, and sculpin in the creek. Ultimately, my wife and I bought a small farm on the Schuylkill where for 30 years I became her daily companion with the dogs on nature walks; the children enjoyed backyard ducks, deer and eagles.

I retired and we moved to Angola Neck in 2016. Susie Ball, whom we met in Nome Alaska, encouraged us to volunteer at the Center for the Inland Bays and join Sussex Bird Club. In Delaware, our grandchildren have seined with the Center's fish and blue crab citizen science volunteers (to the delight of the team and the kids), crabbed at Massey's Landing, clammed at Holt's Landing State Park, birded at Prime Hook and Indian River Inlet, and hiked in Cape Henlopen State Park and Angola Neck Preserve. The grandkid's version of "catching guppies" was poorly supervised netting of grass shrimp and blue crabs at our development's pond.

Nature experiences as a child molded my life and career, the lives of our three daughters, one of whom became an environmental engineer, and my nine grandkids, who seem to love "catching guppies" as much as I still do.

Isaac Cohen (age 8) and sister Mikayla (age 6) observed bald eagles on the Center's pontoon boat ride

(Oysters continued from page 1)

Above: Volunteers pose after loading up the barge

Right: Bags of recycled oyster shells were emptied to form the reefs

A finished section of the reef is visible on a low tide

to build three small-scale pilot reefs to use for this research. The three reefs were installed in three different areas, which may all be suitable habitat for more oyster reefs in the future. By using these reefs to conduct research, Center staff will learn how disease, predation, and higher salinity levels may impact future oyster reef projects.

The pilot reefs are a bit different than oyster restoration projects conducted elsewhere in the mid-Atlantic area. Rather than using concrete structures to serve as the reef substrate, the Center was determined to create its pilot reefs from recycled oyster shells. Research has shown that oyster larvae prefer oyster shells over concrete to settle on. And luckily, recycled shell was readily available thanks to restaurants participating in the Center's *Don't Chuck Your Shucks* Program.

The shells came from oysters consumed by restaurant patrons in partner restaurants. Restaurant staff separate the shells into bins that are picked up by the Center's Don't Chuck Your Shucks driver. These shells are left to cure in the elements and are bagged by volunteers over the winter and spring. To create the reefs, 10 tons of recycled shell were loaded onto boats and barges and used to create three 10 foot by 40-foot reefs. So rather than ending up in a landfill, these shells have been given a second life as the foundation and building material for the pilot oyster reefs.

After construction, each reef was seeded with adult oysters supplied by the Center's Oyster Gardening Program. Gardeners helped raise over 2,305 adult oysters which will help provide immediate water quality benefits to the surrounding areas, and will also provide a source of spat (baby oysters) for continued reef growth.

Initial monitoring of the reefs show that many of the recycled shells have spat settling on them—an early sign that future restoration projects have good potential for success!

While this project may sound mouth-watering, none of the oysters are for consumption. But a robust and healthy population of oysters in the Bays would provide immense water quality benefits, helping reduce nutrient pollution and controlling algae, while also providing critical habitat for numerous fish and invertebrate species. To help support the Center's efforts to restore wild oysters, sign up to grow oysters off your dock, eat at a participating Don't Chuck Your Shucks restaurant, or volunteer to help monitor the reefs.

Volunteer Spotlight: Dennis Bartow *by Anna Short, Fundraiser*

On October 29, the Center's own **DR. DENNIS BARTOW** was awarded the 2019 Governor's Outstanding Volunteer Service Award. Dennis was nominated by Center staff for his countless contributions to the Center over more than a decade.

Dennis receives his award from Governor John Carney

In 2014, Dennis smiles for the camera during a Horseshoe Crab survey demonstration

Below: Dennis leads a field trip at the James Farm during the 2019 NEP Transfer Session

Originally from Pennsylvania, Dennis dedicated his career to education. He spent nearly 40 years as a teacher and a school administrator before his retirement in 2007. "Education was not my job, it was my life," he says, "I am so fortunate to be able to continue that, to keep on learning so I can help other people learn."

When Dennis came to the Center in 2008, he returned to teaching as an environmental educator at the James Farm. He later became the coordinator for the Schoolyard Habitat Program and upon its completion in 2013, every school in the Indian River School District had its own schoolyard habitat.

Today, Dennis is most known for his involvement in the Center's citizen science programs. Other volunteers love to work with him because he contains volumes of knowledge and his enthusiasm for learning is contagious. But Dennis wasn't always an expert.

Back in 2010, when volunteer Ron Kernehan approached him to participate in the in-shore fish and blue crab survey that he was developing for the Center, Dennis hesitated because he knew nothing about fish. But Ron assured him he would teach him everything he needed to know. And he did.

When Ron passed in 2015, Dennis vowed to continue Ron's work. Now after 10 years, data collected from the survey will be submitted to the Mid-Atlantic States Fish Management Council to inform catch limits. "But we can't stop at 10 years," Dennis insists. "It needs to continue. And it will continue as long as I can stand upright in the water!"

In addition to the Fish and Blue Crab survey, Dennis is heavily involved as a team leader in the Horseshoe Crab survey and tagging efforts. In 2019, Dennis and his team of volunteers tagged 3,000 horseshoe crabs for the US Fish and Wildlife Service. The information reported through the tagging program helps to inform management of the species, which is a treasured icon of the Inland Bays watershed. The tagging data also resulted in a peer-reviewed scientific article authored by the Center's Environmental Scientist, Andrew McGowan.

Dennis also serves on the Center's Citizens Advisory Committee, conducts educational presentations about the Inland Bays in the community, and has assisted with oyster reef construction, terrapin patrol, reforestation, and a number of other projects and programs that help the Inland Bays. "I believe in the Center's mission and goals. If I can contribute to them, that is more than worth my efforts."

When asked what he enjoys most about volunteering with the Center, Dennis admits it's hard to pinpoint one singular thing. "I get to work with wonderful people," he says, "and the team camaraderie is remarkable." But perhaps his favorite thing is teaching students at the James Farm. "Many have never been outside beyond their own neighborhood. So to be there for their first time holding a fish, to see their smiles and their enthusiasm, it just warms my heart!"

In 2018 alone, Dennis logged 480 volunteer hours. But he isn't only generous with his time—he is also a financial supporter of the Center, placing him in that very special category of volunteer-donor. ***Congratulations on your well-deserved recognition by Governor Carney, Dennis. We are so appreciative of everything you do for the Inland Bays!***

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CIB MISSION

To preserve, protect and restore Delaware's Inland Bays and their watershed.

VOLUNTEER CLASSIFIEDS

Excellent Opportunity!
Horseshoe Crab Survey volunteers. April- June, nights & evenings. Training in early spring. e-mail vspice@inlandbays.org

Looking for outgoing docents- Chat with James Farm Preserve visitors, provide info about the Center. Day time shifts, peak summer season. e-mail nperezperez@inlandbays.org

Wanted- Fish & Blue Crab Survey volunteers. Spring- fall. Must be willing to measure fish & collect data. Training offered each spring. e-mail environment@inlandbays.org

Volunteer Opportunities- Winter & spring volunteer projects include; oyster shell bagging, reforestation events, photography, outreach & education events, and more! For more volunteer events and to find out how you can get involved call (302)226-8105 or e-mail nperezperez@inlandbays.org